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Occasional Papers on the Kinds of Plants

By L. H. Bailey

Certain Rubi of the Occidental Tropics

7. Three Idæobati
8. Rubus on Jamaica
9. Rubus on Hispaniola
10. Rubi of Panama

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166. RUBUS CORONARIUS, about one-half natural size. An Asiatic species much naturalized in the occidental tropics; cultivated in the United States as a rose.

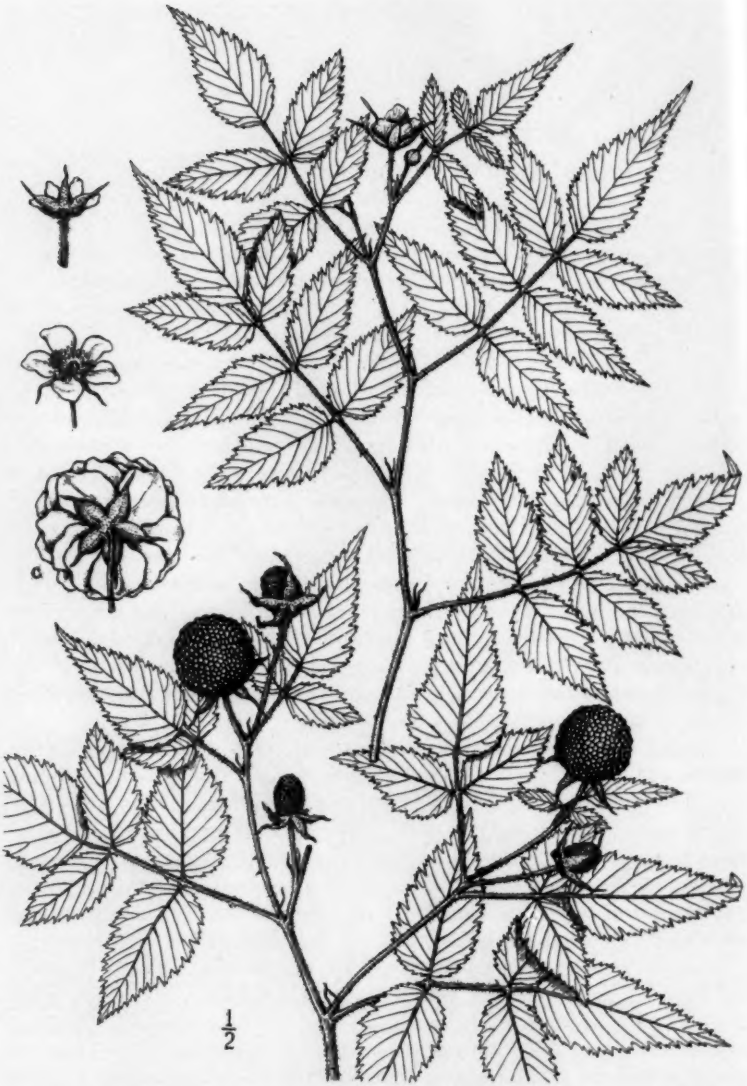
CERTAIN RUBI OF THE OCCIDENTAL TROPICS.

In the past few years I have had to pass on certain confusions in species of Rubus in the western tropics north of the equator; and I am also under commitment to prepare Rubus for Woodson & Schery, Flora of Panama. These confusions pertain to three geographies: Jamaica; Hispaniola (Haiti, Santo Domingo); Panama. To these three problems we may add an account of three species introduced into the tropics and which also sometimes appear or have appeared in cultivation in the United States.

Before proceeding to these discussions we may pause to learn that the plants now to be discussed belong to wholly different groups from the native blackberries and raspberries of North America. The three introduced species, first to be discussed, are Idæobati or raspberries, of Focke's Section Rosæfolii, not represented in the native flora of the United States and Canada. Most of the blackberries, Eubati, here considered belong to Range Paniculiformi (Gent. Herb. v, 46), the same as the prevailing European species, with the main flower-clusters terminal on the cane and panicle-like as distinguished from our native blackberries, which fall into Range Inpaniculiformi, in which flower-clusters are mainly lateral and not panicle-like: note Fig. 176. We shall find, in the due course of the development of the monograph, Species Batorum Boreali-Americana, that certain of the European paniculiform species are naturalized in North America; they have not yet been worked out.

Rubus in the American tropics is in need of a single comprehensive monograph. When study of the genus is divided between the different countries and regions it is difficult to obtain a continental view. The single world monograph of Rubus, Focke, Species Ruborum, 1910–1914, contains between 60 and 70 species from the part of the American continents south of the United States, in a total of about 440 species in the world and any number of prospecies, subspecies and varieties. About 40 of the species are Eubati. One gets the impression that this is a small representation; it probably reflects lack of material. He apparently had nothing from Panama. We have a single treatment for the region south to Panama in Rydberg, North American Flora, 1913; he includes 41 species south of the United States, of which 35 are Eubati. The relatively larger number known to Rydberg than to Focke suggests the additions to the entire tropical area that a purposeful collection and study would yield.

Drawings in this Fascicle are by Florence Mekeel.



167. RUBUS ROSÆFOLIUS, extensively run wild in the American tropics and behaving like a native plant; Asiatic. The edible fruit is sold in Puerto Rico. At C is a rear view of the double flower of *Rubus coronarius* for comparison in size and structure.

Gen. Lib.
Bailey Herbarium

ARTICLE 7.
THREE IDÆOBATI.

Three wandering Rubi are here discussed, to which might be added *R. illecebrosus*, Focke, except that it is not tropical and is not part of our present problem. *R. illecebrosus* is Japanese, long confused with *R. rosæfolius*; it has been introduced into this country as a pomological berry and has run wild in many places; it is hardy, even as far north as the Lake Superior country; we shall meet it again in our Species Batorum studies.

A. Flowers solitary, terminating short lateral branchlets from old wood (floricane axis), or perhaps on new wood from the ground where the canes kill back: prickles on main canes or axes many, strong, broad-based: young parts glabrous or nearly so, resinous-dotted: leaflets not conspicuously long-acuminate: corolla full double, rose-like; calyx-lobes broadly ovate and caudate.....1. *R. coronarius*

AA. Flowers few or solitary on top shoots of new canes: prickles on main canes few or almost wanting, small, not broad-based: leaflets prominently long-acuminate: corolla not polypetalous; calyx-lobes lance-ovate or narrower, sometimes caudate.

B. Leaflets mostly 7: young growth soft-pubescent: flowers mostly solitary and scattered, not in clusters.....2. *R. rosæfolius*

BB. Leaflets mostly 5: young growths glabrous: flowers close together in upper axils, forming an open cluster.....3. *R. probus*

1. **Rubus coronarius,** Sweet Hort. Brit. 144 (1827); Bailey, Hortus, 542 (1930). BRIER-ROSE. Figs. 166, 167c.

R. rosæfolius var. *coronarius*, Sims, in Bot. Mag. t. 1783 (1816).

R. sinensis, Hort. ex Sims, l.c.

Erect, 1 m. more or less, aspect of a rose bush; primocanes soft and semi-herbaceous till late in season, glabrous or essentially so, prickles usually many; floricanes stout, terete or obtusely angled, becoming 7–9 mm. thick, puberulent or resinous-dotted toward summit; prickles 2–3 cm. apart, stout and broad-based, straight or nearly so: leaves pinnate, glabrous on both surfaces; leaflets frequently 9 on strong primocane axes, commonly 7, on floricanes often reduced to 5 or even to 3, lanceolate, narrowly acute but usually not prominently long-acuminate, 4–6 cm. long, 1–2 cm. broad, margins closely double-serrate with callous points, petiolules very short or none; petiole glabrous, 3–7 cm. long and armed (as is the rachis) with broad-based more or less hooked very sharp prickles: flowers solitary on lateral usually short shoots from floricane axis, white, very polypetalous, 3–5 cm. across, resembling a soft double rose, stamens usually all transformed but the gynœcium at least often intact and perhaps sometimes producing a small fruit like a raspberry but the flower commonly sterile; calyx large and prominent, the 5 lobes broadly ovate-cordate.

Nativity unknown, supposedly southern Asia; whether the plant de-

veloped as a cultigen is not determined, nor, in that case, is the original stock or species recognized. It can hardly have come from *R. rosæfolius*. It is planted in warm countries around the world, usually called a rose, and it has also run wild; it has means of propagation by free suckering. In nurseries the plant is propagated by root-cuttings.

I have taken it in the Corcovado Range near Rio de Janeiro, where it appeared to be holding its own. I have it wild or semi-wild from Guatemala and Santo Domingo. E. E. Barker collected it "near an old abandoned hut near Las Cruces, Cayey, Puerto Rico. It filled the woods in a large thicket. Said to grow about old coffee fincas where it is semi-wild about the houses." In 1926 I took specimens in Golden Gate Park, San Francisco, as a naturalized plant; Mr. Eric Walther, at that place, now writes me that it has disappeared for some years.

As a cultivated plant it is known as Salem rose, Easter rose, Bramble rose, seen most frequently, in this country, in the southern states but it has bloomed in the open ground in northern New Jersey. Fig. 166 is drawn from a plant in a garden in Baton Rouge, Louisiana, called to my attention by Professor Clair A. Brown. The natural history of the plant is one of the Rubus mysteries; the easy assumption that it is only a double-flowered race of *Rubus rosæfolius* has halted inquisitiveness about it, and we do not yet know its kinship. It is now technically described.

2. **Rubus rosæfolius,** Smith, Plant. Icon. Hact. Ined. fasc. ii, t. 60 (1790). Fig. 167.

Bushy spreading plant more or less lopping with age, 1 m. tall more or less, much branched, slender, glandless, pubescent-pilose on the younger axes and on the petioles and peduncles; canes or axes becoming 4–5 mm. thick, terete, carrying a few straight or slightly curved not broad-based prickles 2–3 mm. long: leaves odd-pinnate, thin and not coriaceous, more or less puberulent on both surfaces, mostly 7-foliolate but those associated with the flowers sometimes 3-foliolate; leaflets lance-acuminate, 5–7 cm. long, 2–3 cm. broad, margins coarsely double-serrate, petiolules very short; petiole 2–4 cm. long and commonly bearing a few prickles: flowers 1–4 on leafy shoots near top of floricanes, not in a definite cluster, mostly more or less covered in the foliage, white, not large or showy, obtuse petals usually much exceeded by the elongated slender lanceolate pubescent calyx-lobes, corolla 1.5–2 cm. across: fruit a globular to short-oblong raspberry, about 2 cm. broad and long at maturity, light scarlet, soft and very seedy, core large, of mild slightly acid fresh but indifferent taste but much eaten in some countries; achenes lunate-oblong, very prominent, 1–2 mm. long, much wrinkled and pitted.

India to Java, mostly in temperate mountains. Described from Mauritius, but it is an introduced plant there (*R. Commersonii*, Poir.), having been brought by Philibert Commerson (1727–1773) from the Malay Isles according to Baker. Now naturalized around the world in tropical and

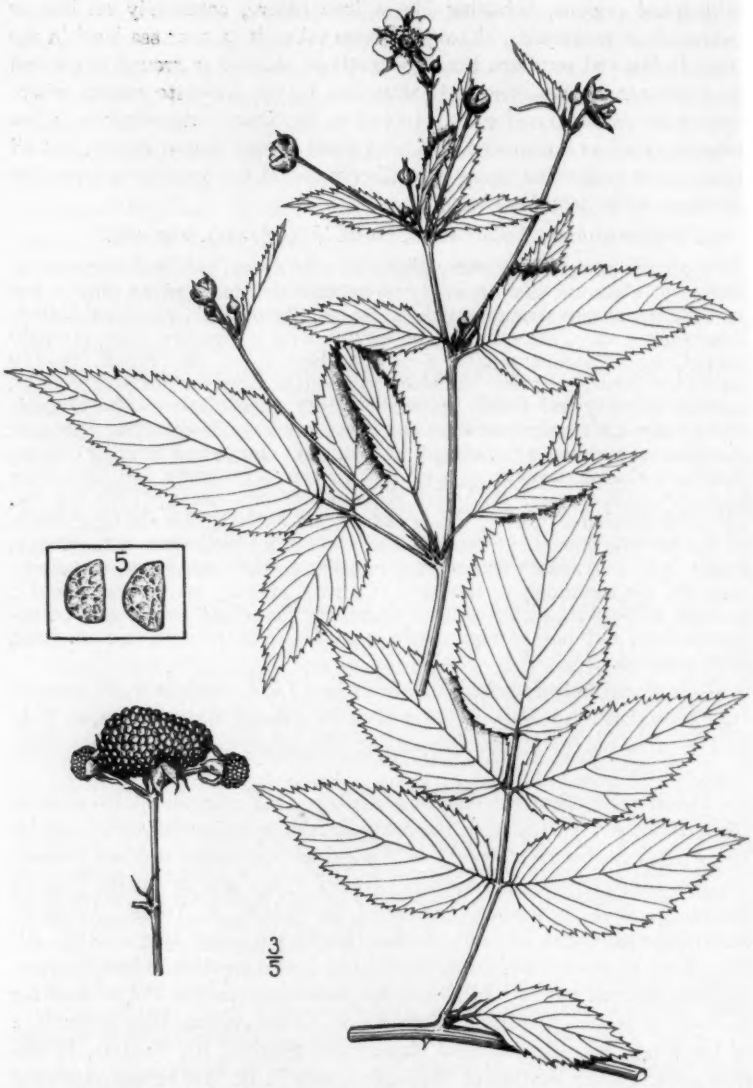
subtropical regions, behaving like a true native, commonly on low or intermediate mountains, although I have taken it at near sea level in the West Indies and southern Brazil; sometimes planted as ground cover and for fruit. On Puerto Rico it is abundant in the Aibonito region, where berries are gathered and sold to travellers, as "fresa" (strawberry). It has been reported as introduced as a fruit plant in the United States, but all I have seen under that name is *R. illecebrosus*. It has sometimes passed in literature as *R. jamaicensis*.

3. **Rubus probus,** Bailey, Gent. Herb. i, 150 (1923). Fig. 168.

Vigorous upright branching plant, to 2 or 2.5 m. tall, bending over at maturity, glabrous, glandless, the very smooth axes bearing only a few and distant nearly straight prickles: leaves odd-pinnate, glabrous; leaflets commonly 5 or 7, sometimes 3 or even 9, firm in texture, very strongly veined, lanceolate-acuminate, 6–10 cm. long 2.5–4 cm. broad, usually somewhat tapering to base but often subcordate, apex narrow and pointed, margins coarsely and doubly apiculate-serrate, petiolules very short, rachis and petiole commonly bearing a few short prickles: flowers few, borne on conspicuous peduncles from upper axils of leafy shoots and forming only an indefinite cluster, sometimes 2 or 3 flowers on a peduncle and then close together, pedicels and peduncles glabrous; corolla small, about 1.5 cm. across or sometimes 2 cm., petals obtuse and exceeded by the long points of the narrow somewhat punctate ciliate calyx-lobes: fruit a raspberry, bright light red, oblate or flattened endwise so that the berry is likely to come off the receptacle in the form of a ring, about 3 cm. across, about 2 cm. top to bottom, seedy, soft, of agreeable flavor and prized as a pomological fruit but not of high quality; seed (achene) ovoid, 2 mm. long, deeply pitted.

Recognized only in cultivation in Puerto Rico, where it was known as the Queensland raspberry, having been introduced from Australia. It is still growing on the station grounds at Mayaguez and has escaped there from cultivation.

This berry is Plant Introduction number 23748, introduced from James Pink, Brisbane, Australia, in the form of seed, and distributed in 1908 by the United States Department of Agriculture to "some thirteen persons scattered throughout the country," one of whom was in Puerto Rico at Boyamon, as I am recently informed by Robert A. Young, Associate Horticulturist of the Division of Plant Exploration and Introduction. All the efforts to grow the plant in the United States resulted in early failure, apparently from lack of hardiness. The plant was prized in Puerto Rico for its fruit. A picture appeared, without text, in the Annual Report for 1912 of the Porto Rico Agricultural Experiment Station, Rio Piedras. It was also grown at the Station at Mayaguez, and T. B. McClelland, Director at that Station, wrote me in 1932 that he had been very enthusiastic about the berry, but that the cultivation had not been continued, and that the plant was "making its own headway independent of cultivation."



168. RUBUS PROBUS. Introduced into Puerto Rico as a fruit plant and now somewhat established. Supposed to be a hybrid but probably an oriental species. Seeds (achenes) in the box.

My first contact with this Rubus was in specimens collected at Mayaguez in 1916 by the late Chester Hunn, Professor of Horticulture at Mayaguez. In 1922 I received specimens of it from Dr. N. L. Britton taken at the Insular Experiment Station at Rio Piedras. Material also was sent me at least as early as 1922 by J. P. Griffith, Horticulturist of that Station, who asked for a botanical identification; on the Griffith material I founded *Rubus probus* in 1923, supplemented by specimens sent by McClelland that year from Mayaguez. In 1932 I visited the Station at Mayaguez and found *R. probus* not in cultivation there but "established and more or less wild." History of the Queensland berry in Puerto Rico may be found in articles by J. P. Griffith in Journal of the Department of Agriculture of Porto Rico, ix, 28 (January 1925) and in Journal of Heredity, xvi, number 9 (September 1925).

Botanical history of the plant eventually described as *Rubus probus* is not clear. The Inventory Card at time of introduction of the seeds in 1908 states that the plant was reported as a cross by James Pink between *Rubus ellipticus* and *R. rosæfolius*. In founding *R. probus* in 1923 I questioned the reputed origin, stating that the Puerto Rico stock must be "at least a second-generation cross," since it was introduced as seeds and wondered "whether the plant grown in Queensland is a first-generation hybrid multiplied asexually and has a different character from ours." There is no suggestion of the very different *Rubus ellipticus* in any of the plants grown in Puerto Rico. Subsequent to my taxonomic study of the plant, J. P. Griffith had written (on November 26, 1923) to Mr. Pink at Brisbane for further information on the origin of the Queensland raspberry (Journ. Dept. Agr. Porto Rico, ix, 29). He received reply written the following January by Miss Jane M. Pink, saying that her brother, James Pink, had passed away on November 2, 1923; "he had been so ill during the last few years that he had been unable to get into his experimental garden," which had become a wilderness "and the raspberry in question had evidently died out." Presumably the introduction of 1908 had been made before these confusions had arisen, yet one is not qualified to make a definite pronouncement on the origin and nature of the berry introduced into North America. As Mr. Pink was an experimenter it is likely that he had other Rubi in his garden. I note also the published statement by Griffith to the effect that the berry about which he was writing was introduced to the Experiment Station at Mayaguez as *plants* in 1912. My supposition is to the effect that the plant I named *Rubus probus* may be an older species introduced to Australia from some foreign part.

Professor Rafael H. Cintrón of Mayaguez now writes me that the fruit may have more or less the importance on lowlands that berries of *R. rosæfolius* have on the highlands.

169. Rubus jamaicensis. Known to be native only on the island of Jamaica although reported elsewhere.

ARTICLE 8.
RUBUS ON JAMAICA.

Only two Rubi are known to be native in Jamaica, both of them mountain species, *R. jamaicensis* of Linnæus, *R. alpinus* of Macfadyen. It is odd that with all the Rubi described from mountains about the world from early times it should have remained for James Macfadyen (1800–1850) to have applied such a common epithet as *alpinus* as late as 1850. This species has been attributed to the mountains of Panama by Rydberg, and this brings it into the present discussion. Any person familiar with the phytogeography of the island of Jamaica and the continental mountains of Panama will be arrested by such a distribution and will examine the evidences. I have specimens of both Jamaican Rubi from the wild, although they may be rare in collections, and contrasts are readily drawn although the species are similar; this will then leave us free to discuss the situation in Panama.

One wonders why the diverse and fertile island of Jamaica yields only two species of Rubus, so far as now known, while the contiguous Hispaniola has nine or ten. Here is a problem for the phytogeographer.

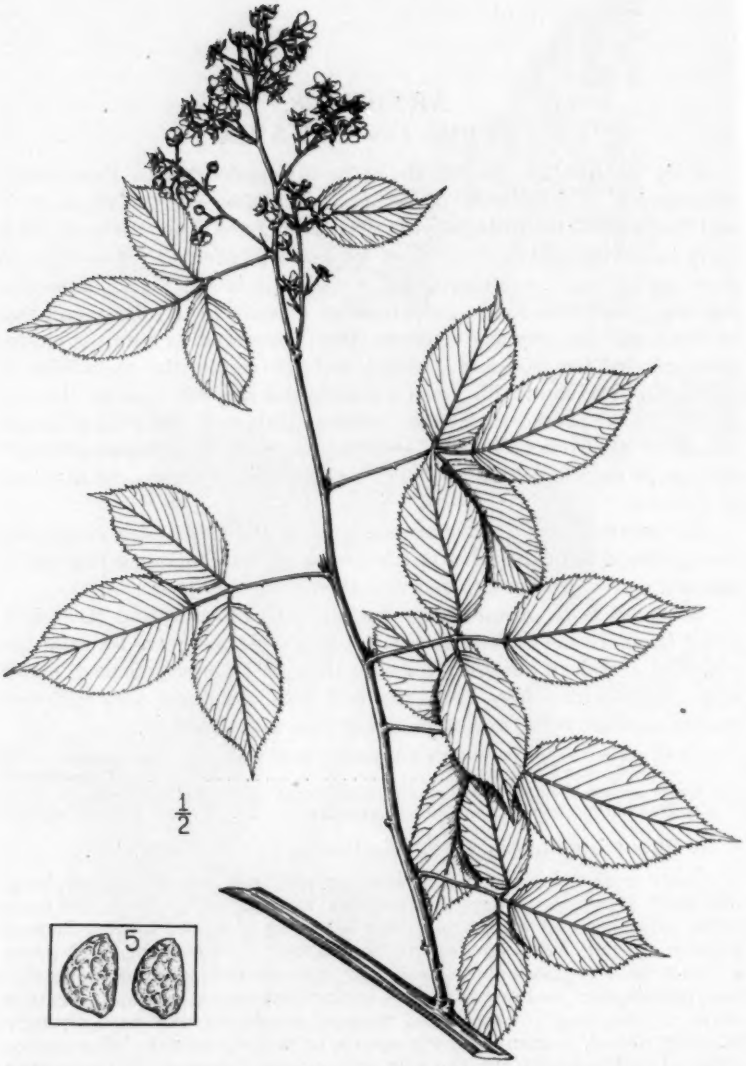
Focke refers *R. jamaicensis* to his subgenus Eubatus, and *R. alpinus* to his Lampobatus. Perhaps he had not seen good specimens for comparison. The Jamaican botanists consider them to be closely related, and I agree. Both names have been confused with other and very different species, and this is the reason for giving them new diagnosis.

A. Under surface of leaves strongly soft-pubescent or tomentose; leaf-margins coarsely double-serrate ..... 1. *R. jamaicensis*

AA. Under surface of leaves nearly or quite glabrous, at most not soft-pubescent; leaf-margins minutely and closely serrulate ..... 2. *R. alpinus*

1. **Rubus jamaicensis,** Linn., Mantissa, i, 75 (1767). Fig. 169.

Canes more or less trailing or climbing, said to be sometimes 5 m. long, with erect flowering and fruiting branches; axes angled, 4–5 mm. and more thick, grayish-pilose when young but becoming glabrate, bearing hooked prickles 2–3 mm. every one or two cm.: leaves 3–5-foliolate, firm, glabrous and more or less glossy above, soft-tomentose or -pubescent on under surface, petiole stout and provided with hooks; leaflets ovate-oblong, abruptly acute, 7–9 cm. long, 4–5 cm. broad, rounded or subcordate at base, strongly laterally ribbed, margins coarsely serrate or dentate-serrate: inflorescence terminal and paniculiform, the axis and pedicels pubescent to tomentose; flowers numerous, white, small, about 1 cm. across, petals obtuse at expansion; calyx-lobes ovate, not prolonged, gray-pubescent: fruit globular to



170. Rubus alpinus. Native on the elevated parts of Jamaica; erroneously reported from Panama.

short-oblong, 1 cm. or less long, palatable and gathered for "tarts and other sweetmeats" as Macfadyen writes.

Jamaica, in many parts of the island from 1000 to 5000 feet altitude. Said to grow on Hispaniola but I have never found it there or seen specimens from that island; it is listed, however, by Barker & Dardeau in La Flore d'Haiti, and by Moscoso in his recent Catalogus Floræ Domingensis (1943).

2. **Rubus alpinus,** Macf., Fl. Jamaica, ii, 7 (1850). Fig. 170.

Straggling or trailing plant, or climbing among bushes, general habit of *R. jamaicensis* but distinguished at once by the nearly or quite glabrous leaves and branchlets, absence of tomentum or soft pubescence, smaller and more deeply purple fruit (5 mm. thick) as well as the finer and closer serration of the leaf-margins, flowers with a purplish tinge: stems purple, angled, bearing a very few small recurved prickles: flowers in a medium-sized paniculiform terminal cluster, usually less profuse that that of *R. jamaicensis*, the peduncles and pedicels hairy-pubescent; calyx-lobes lance-ovate and pointed, hairy-pubescent.

Jamaica: Cinchona and surrounding hills, at about 5000 feet altitude. Attributed to other countries, probably all erroneously.

171. Rubus florifolius, new species of blackberry from Provincia de Azua, Santo Domingo.

ARTICLE 9.
RUBUS ON HISPANIOLA.

In La Flore d'Haiti, 1930, Barker & Dardeau list six species of Rubus; in Catalogus Floræ Domingensis, 1943, Moscoso also lists six species, although the lists do not correspond throughout. Both works admit *R. rosæfolius*, which is a naturalized Asian species described on page 328; also *R. jamaicensis*, for which I do not know any authentic material from that island. I am fortunate to have Rubus material from Professor R. M. Moscoso and Dr. José de Js. Jiménez, with both of whom I have had the pleasure of companionship on collecting trips in their country. For Haiti I have material from Dr. Frédéric Kebreau of the College of Agriculture at Damien; and Pierre Sylvain has been my associate when I have made important Rubus collections on the high mountains in the Massif de la Selle; I have also examined the Rubus collection in the herbarium of the College at Damien in which are specimens of Ekman, the tireless Swedish collector. I have had access to herbarium material from Hispaniola in institutions in the United States.

Only two specimens ticketed *Rubus rosæfolius* have I seen from Hispaniola, both from Santo Domingo; they are *R. coronarius*. One is from the peninsula of Samaná; the other is from Los Montones, Province Santiago, from a garden and is known under the common (Spanish) name "Rosa silvestre." Undoubtedly the true *R. rosæfolius* is established on the island.

The native species of Rubus attributed to Hispaniola are four: *R. domingensis*, *R. Eggersii*, *R. Barkerianus*, *R. selleanus*. The oldest of these species dates only from 1890. From the material in my herbarium I am compelled to distinguish nine species, and there are indications of one or two others of which I have only insufficient material.

First effort to describe species of Rubus from Hispaniola was by W. O. Focke in 1890 in his article "Die Rubus-Arten der Antillen" published in Abhandlungen herausgegeben vom naturwissenschaftlichen Vereine zu Bremen, volume xi. Here *Rubus domingensis* and *R. florulentus* var. *Eggersii* were established. Second effort was by P. A. Rydberg in North American Flora, xxii, 1913, where Focke's *Eggersii* was elevated to specific rank. Third effort was by B. Helwig in Arkiv för Botanik, xxii, Stockholm, 1929, in his contribution "Plantæ Haitiensis et Domingenses novæ vel rariores"; *R. selleanus* and *R. Barkerianus* were established. The present article is the fourth effort.

The Rubi of Hispaniola are a difficult lot, and much responsible collecting is yet required to enable us to understand them. The collecting should be undertaken with care and deliberation, not merely to cut specimens and put them in press. In the meantime, the following key should suggest to the collector the main distinguishing marks of these interesting and perhaps variable plants as at present understood. The specific lines are to be passed on only after careful comparative examinations.

All the Hispaniolan species are glandless.

Key to the nine native Hispaniolan brambles

(Range given as Prov. in Santo Domingo, as Dept. in Haiti).

A. Flower-clusters scattered in axils of leaves as well as terminal, all of them short: leaflets elliptic or narrowly ovate, terminal one perhaps subcordate, short-acuminate, tomentose underneath: prickles few and scattered, none in inflorescence: leaves not pergamentaceous. Prov. Azua. 1. *R. florifolius*

AA. Flower-clusters at or near apex of floricane, mostly elongated, combining to make a terminal inflorescence, not scattered along the cane among the foliage.

B. Leaves pergamentaceous (parchment-like), persisting the next year on the floricanes and then usually shining and nearly or quite glabrous on the upper surface: stiff-foliaged plants.

C. Leaflets on floricanes about as broad as long, rounded or very obtuse at apex.

D. Primocane leaflets also obtuse, or only very briefly acute: lightly armed: leaflets cordate. Dept. Ouest ..... 2. *R. selleanus*

DD. Primocane leaflets acuminate; under surface silvery-tomentose: strongly armed: leaflets not cordate or subcordate. Dept. Ouest ..... 3. *R. argentifrons*

CC. Leaflets on floricanes decidedly acute or acuminate.

D. Persistent leaflets (at least the terminal one) about twice longer than broad, oblong. Depts. Artibonite, Ouest ..... 4. *R. Barkerianus*

DD. Persistent leaflets two-thirds as broad as long, ovate.

E. Under surface of leaves thinly pubescent: serratures small and very sharp: inflorescence of several short branches. Prov. Santiago, La Vega ..... 5. *R. Eggersii*

EE. Under surface of leaves brown-tomentose: serratures medium size, not sharp: inflorescence paniculiform. Prov. La Vega. ..... 6. *R. effertus*

BB. Leaves not pergamentaceous or shining, not habitually persistent: soft-foliaged plants.

C. Leaf-margins strongly and argutely serrate; leaflets two-thirds as broad as long. Prov. La Vega ..... 7. *R. domingensis*.

CC. Leaf-margins hardly argute or sharply serrate; leaflets narrower.

D. Shape of leaflets narrow-ovate, base not cordate, not rugose: prickles conspicuously large. Prov. La Vega ..... 8. *R. stimuleus*

DD. Shape of leaflets ovate to broad-ovate, terminal one cordate or subcordate, rugose: prickles not prominently large. Dept. Ouest ..... 9. *R. hailiensis*

† 1. **Rubus florifolius,** spec. nov. Fig. 171.

Probabiliter erectus, foliosus; axis floricani gracilis, teres, floccoso-pubescens; aculei pauci, recti sed fere declinati, basi lata, circa 5 cm. longi:

folia floricanorum 3-foliolata, foliola angusto-ovata vel oblongo-ovata, 5–7 cm. longa, 2.5–3 cm. lata, acuminata, foliolum terminale subcordatum, foliola lateralia angustata basi, prominenter serrata, pæne vel admodum glabra supra, infra fulvo-tomentosa; petiolus 3–4 cm. longus, pubescens, aculei uncinati: inflorescentiæ aliquot, terminales et laterales in axilis, tomentosæ, 5–7 cm. longæ, flores congesti, pedicelli brevissimi; calyx tomentosus, lobi lati, acuminati, breviores quam petala.

Apparently erect; primocanes not seen; floricane axis slender, terete, whitish-tomentose toward the top, floccose-pubescent elsewhere; prickles not abundant, scattered, straight but usually declined, broad-based, about 5 mm. long: leaves 3-foliolate, not very large, soft or not pergamentaceous, nearly or quite glabrous above, rusty-tomentose underneath, margins sharply and almost uniformly serrate; leaflets narrow-ovate to oblong-ovate, terminal one more or less subcordate, lateral ones somewhat narrowed but with broadish bases, 5–6 or 7 cm. long, 2.5–3 cm. broad, all acuminate; petiole 3–4 cm. long, pubescent, armed with a few short hooks: flower-clusters several to many, small, one of them terminal and others lateral from axils of full-grown leaves, apparently not much if any exceeding 5–7 cm. long and little if at all surpassing the leaves and usually much shorter, axes gray-tomentose, the lateral clusters of 10 or fewer flowers, terminal clusters perhaps somewhat more floriferous; flowers small and crowded, pedicels very short; calyx tomentose, lobes broad, acute or acuminate, not equalling the petals.

Santo Domingo: Sierra de Ocoa, Provincia de Azua, about 1600 m. altitude, *Ekman 11,946* (type); Les Cunitas, Azua, 1300 m. altitude, *Padre Fuertes 1874*; both collections passed heretofore as *R. domingensis*.

2. **Rubus selleanus,** Helwig, in Arkiv för Botanik, xxii, hfte 2, p. 25 (1929). Fig. 172.

Stems erect or at length curving and 2 m. or more long, obtusely angled, pubescent, bearing straight strong prickles 5–7 mm. long: leaves pergamentaceous, mostly 3-foliolate although sometimes trilobate or simple in the inflorescence; terminal leaflet suborbicular or obovate, 6–8 cm. long and 5–7 cm. broad, rounded or subtruncate or subcordate at base, obtuse and rounded at apex or sometimes very briefly cuspidate-acuminate; lateral leaflets orbicular or oval-rotundate, 4–7.5 cm. long and 3–7 cm. broad; leaflets on lateral shoots and primocanes often oblong and nearly or quite twice as long as broad; all leaflets sparsely pilose on upper surface, densely short-pubescent underneath, nerves impressed above and prominent underneath, midrib underneath bearing curved prickles; margins minutely and closely serrate; petiole 1–3.5 cm. long, bearing small hooked prickles: inflorescence terminal or in upper axils, composed of racemiform parts combined into a short broad cluster 10–16 cm. long that bears lanceolate or ovate-lanceolate tomentose bracts; petals obovate, 11–14 mm. long, thrice exceeding the obtuse or mucronulate calyx-lobes: fruit small, nearly or quite globular, about 1 cm. thick.

Haiti: Massif de la Selle, Ouest; type *Ekman 1263* on Morne Tranchaut 1650 m. altitude; Forets-de-Pins, *Bailey 206, 207*. The original description

172. RUBUS SELLEANUS, described by Helwig, Stockholm, from Massif de la Selle, southern region of Haiti. Primocane leaf at A, reduced.

173. RUBUS ARGENTIFRONS, with silvery under surface of leaves, and primocane leaflets different from those of *R. selleanus*, and peculiar inflorescence. Massif de la Selle, Haiti.

was made from the upper part of a flowering shoot, seen in the main drawing in Fig. 172; at A in that figure is a primocane leaf from Bailey 206, showing oblong leaflets.

† 3. **Rubus argentifrons,** spec. nov. Fig. 173.

Decumbens vel diffusus, aculeatissimus; axes 1–1.5 m. longi et pubescentes: folia pergamentacea, molli-pubescentia supra, tum glabrescentia; folia primocani 3-foliolata, argenteo-tomentosa infra, foliola ovato-oblonga, 5–6 cm. longa, 3–4 cm. lata, acuminata, non cordata basi, acute serrata: flores parvi, in racemiformibus terminalibus et lateralibus ramis ultra folia tendentibus; lobi calycis tomentosi, lati, apiculati, magni conspicuique: fructus globosus vel brevi-oblongus, 12–15 mm. crassus, drupeolæ magnæ.

Very prickly plant, the canes mostly lopping or lying on the ground and 1–1.5 long; primocanes angled, closely dull-pubescent, bearing perhaps 10 curved prickles to 2 cm. of stem and 3–5 mm. long and not broad-based: leaves pergamentaceous the second year, 3-foliolate, petioles stout, 4–5 cm. long and pubescent and uncinate; leaflets of primocane leaves ovate-oblong and prominently short-acuminate, 5–6 cm. long, 3–4 cm. broad, margins unequally and conspicuously serrate, upper surface closely but densely hairy-pubescent and soft to the finger, under surface attractively silky-tomentose with all the ribs prominent and midrib carrying a few stout hooks, all 3 leaflets much alike; floricane leaflets often obtuse but commonly short-acute, upper surface of old leaves becoming nearly or quite glabrous: inflorescence of terminal and lateral racemiform brown-tomentose strongly aculeate branches; flowers small, 2 cm. or less across at full expansion, 1, 2 or 3 of them on short tomentose lateral peduncles or pedicels; calyx tomentose, the broad apiculate lobes nearly equalling the petals: fruit small, globose or short-oblong, 12–15 mm. thick, with large drupelets.

Haiti: Forets-de-Pins, at high altitude in Massif de la Selle, *Bailey 197*. To be compared with *R. selleanus*: differs in leaflets less obtuse and usually acute, primocane leaflets narrower and acuminate and silvery-tomentose underneath, not cordate, upper surface of primocane leaves soft-pubescent, axes and petioles and peduncles heavily armed, branches of flower-cluster more racemiform and more extended, flowers apparently smaller; foliage and armature of primocane at once distinguish it.

4. **Rubus Barkerianus,** Helwig, in Arkiv för Botanik, xxii, hfte 2, p. 26 (1929). Fig. 174.

Erect shrub with obtuse angled and deeply furrowed canes that are yellowish-brown-tomentose, about 3–5 mm. thick; prickles crowded, curved, 2–3 mm. long: leaves 3-foliolate, appressed-pilose on upper surface becoming glabrescent, densely tawny-tomentose-pubescent underneath and midnerve aculeolate, all the nerves underneath prominent; terminal or central leaflet ovate or narrowly ovate, 3.5–6.5 cm. long and 3–4 cm. broad; lateral leaflets ovate or short-ovate, 3–5.5 cm. long and 3–4 cm. broad; margins minutely dentate; base of all leaflets subtruncate and often

174. RUBUS BARKERIANUS, from the mountains of Haiti. Described by Helwig from Department Artibonite, but apparently native also in the Massif de la Selle, to the south, where the foliage A and flowers and fruits come from.

lightly cordate, apex acute or sometimes obtuse; petiole 2.5–3.5 cm. long, with curved prickles, petiolules very short: inflorescence terminal, leafless, paniculiform, about 10 cm. long, with lateral branches in the upper axils, bearing lanceolate or lance-linear densely tomentose bracts; calyx tomentose, lobes ovate with obtuse minutely mucronulate lobes; corolla and fruit not described.

Haiti: Massif des Cahos in Montagnes Noires, Artibonite near Pérodin above Ingrande, 1350 m. altitude, *Ekman 3443* (type); above Fonds Verrettes, Ouest, toward the international boundary, above 1000 m., *Bailey 212*. I have not had access to the type collection; but Frédéric Kebreau has collected it for me near Pérodin in the environs of Ingrande; at 1350 m., sterile parts only, and from this material Fig. 174 is partly drawn, apparently correctly determined. The species as here defined appears to be very distinct, but more information is needed.

5. **Rubus Eggersii,** Rydb. in N. Amer. Fl. xxii, 458 (1913). Fig. 175.

R. florulentus var *Eggersii*, Focke, in Abhandl. Naturw. Ver. Bremen, xi, 411 (1890).

Strong and probably diffuse plant 2 m. tall with pergamentaceous persistent leaves shining above; stems stiff, angled, 5–6 mm. thick, pubescent to tomentose, primocane bearing many straight or lightly curved prickles 3–4 mm. long that tend to disappear on floricane: leaves 3-foliolate, perhaps simple in the inflorescence, glabrous, hard and lustrous on upper surface (particularly in the second year as "evergreen"), thinly pubescent on middle and lateral ribs underneath and perhaps sometimes on the veins; terminal leaflet of primocane leaves ovate to oblong-ovate, rather abruptly pointed, 6–9 cm. long, 4–6 cm. broad, subcordate; lateral leaflets somewhat smaller and commonly more briefly pointed; all margins shallowly and closely serrate; floricane leaflets usually smaller and more briefly pointed, subtruncate or subcordate at base; petiole 4–6 cm. long, pubescent or tomentose, conspicuously provided with hooked prickles: inflorescence terminal or 2 or 3 branches from upper leaf-axils, all forming something like an open cluster 15–20 cm. long that sometimes bears a simple leaf or two in the lower part; axis and bracted peduncles pubescent-tomentose, peduncles either single-flowered or 2–3-flowered, only sparsely if at all armed; flowers of medium size, on tomentose pedicels when not solitary; calyx tomentose, the lobes lance-ovate and pointed: fruit nearly or quite globular, 12–16 mm. thick, drupelets many.

Santo Domingo: Mt. Barrero, Provincia de La Vega. *Eggers;* near Constanza, same province, in pines, 1200 m., *Turckheim 2913*, which Rydberg also took to be *Eggersii*; Loma Bajita, in open pines, Provincia de Santiago, *Valeur 894*; Los Montones, 800 m., *Jiménez*; Arroya Las Guácimas, near San José de las Matas, Provincia de Santiago, 800 m. altitude, *Moscoso 340;* banks of small stream, Las Guazumas, Provincia de Santiago, 780 m. in sandy soil in pine forest, *Jiménez*. Probably also in Haiti, *Ekman 9540*, Morne Descassiers, 1200 m. altitude, and Morne Malanga, *Ekman*

175. RUBUS EGGERSII from Santo Domingo, probably native also in Haiti. The persistent more or less broken foliage is indicated at the right.

5472, 1000 m. In his Species Ruborum Focke assigns this plant to mountains at 1000–1500 m. at "Grand fond de Port-au-Prince" as well as Barrero.

I have not had access to the original specimen of Eggers. To understand the species one must remember that Focke considered it a variety of the Puerto Rican *R. florulentus*, from which it differs in stems, branches and petioles being tomentose or hirsute-tomentose, and lower branches of inflorescence often subcorymbosely 3–flowered, prickles small, serratures of leaflets small, carpels tomentose. This means that it must resemble *R. florulentus* in pergamentaceous nitid persistent leafage and small close serratures.

† 6. **Rubus effertus,** spec. nov. Fig. 176.

Validus, vigens, 1.5 m. altus, rami divaricati; axis floricani teres, 4–5 mm. crassus, fulvo-pubescens; aculei multi, basi lata, uncinati, ad 5 mm. longi: folia 3-foliolata, pergamentacea, rugosa, obscura vel lucida et glabrescentia supra, infra fulvo-tomentosa et valde costata; foliola ovato-acuta, sæpe acuminata, 5–7 cm. longa, 4–5 cm. lata, cordata basi; petiolus brevis, pubescens, uncinatus: inflorescentia magna, terminalis, axis continuus, ad 30 cm. longus, fulvo-tomentosus, rami racemiformes, 1–3 floribus, aculeati; flores circa 2.5 cm. diam., petala latissima et obtusa; calycis lobi lati, apiculati, breviores quam petala, reflexi: fructus brevi-oblongus, 1 cm. vel plus diam., multis seminibus.

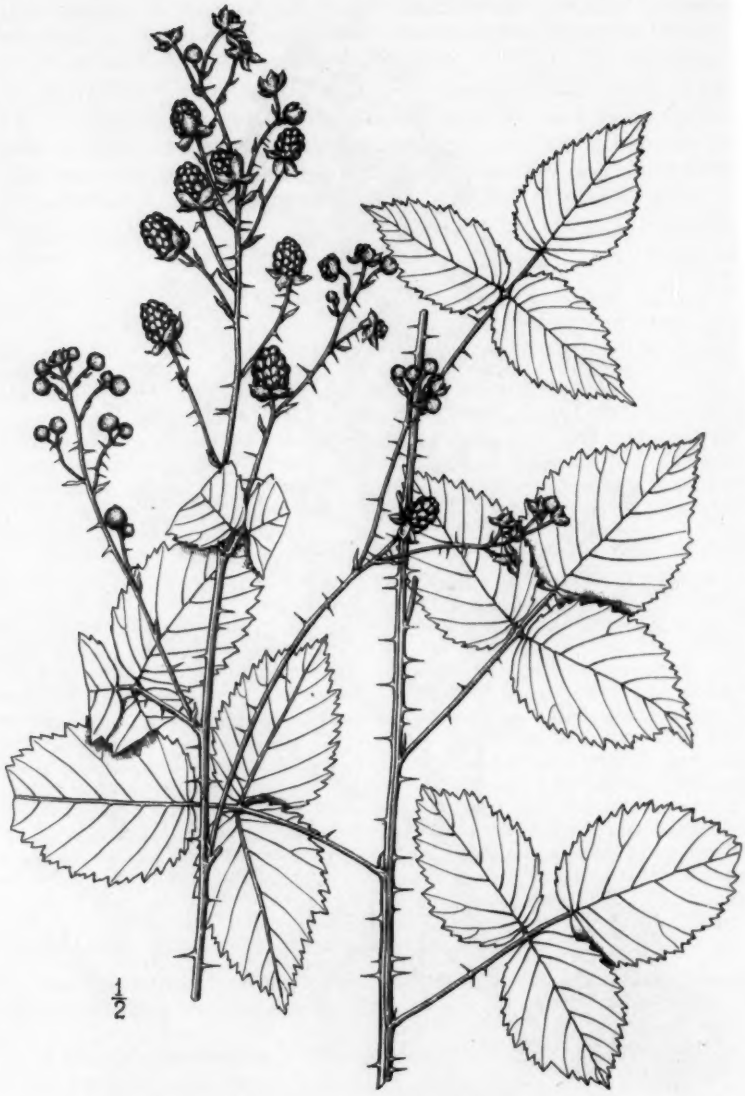
Stout vigorous very prickly species, 1.5 m. tall, branches spreading; primocane undisclosed; axis of floricane terete, or somewhat angled in drying, 4–5 mm. thick, brown-pubescent; prickles many and broad-based, curved, to 5 mm. long: leaves pergamentaceous, thick and rugose, strongly side-ribbed, persisting the second year and then glabrescent but much wrinkled on upper face, indifferently shining or even dull, tawny-tomentose underneath, 3-foliolate or sometimes a simple one in lower part of inflorescence; terminal leaflet ovate, 5–7 cm. long, 4–5 cm. broad, acute or with a short acumen, distinctly cordate at base; lateral leaflets much like the terminal unless relatively shorter and broader; all leaflets broadly and unevenly serrate; petiole short, pubescent, bearing stout short hooked spines: inflorescence a large terminal panicle-like cluster with a continuing central rachis that may be 30 cm. long, the profuse lateral ascending branches racemiform and many-flowered, axes tawny-pubescent and abundantly armed, each pedicel conspicuously bracted; flowers about 2.5 cm. across at expansion, petals very broad and obtuse; calyx tomentose, the broad apiculate lobes much shorter than petals, soon completely reflexed: fruit short-oblong, many-seeded, 1 cm. and more across.

Santo Domingo: Paso Bajito, fourteen kilometers from Jarabacoa going up to Constanza, Provincia de La Vega, 1250 m. altitude, *Jiménez*.

7. **Rubus domingensis,** Focke, in Abhandl. Naturw. Ver. Bremen, xi, 411 (1890); Spec. Rub. iii, 78 (1914). Fig. 177.

Erect, woody, 2–3 m. tall; primocanes angled, somewhat pilose on the young parts, prickles many and straight or nearly so, not strong or broad-

176. RUBUS EFFERTUS. New species with great terminal flower-clusters from Provincia de La Vega, Santo Domingo.



177. Rubus domingensis, from Provincia de La Vega, Santo Domingo, heretofore much misunderstood. Leaves are thin, and coarsely serrate-dentate.

based, 6–9 mm. long: leaves 3-foliolate or sometimes more or less 5-foliolate, thickish but not pergamentaceous and apparently not persistent, glabrous on upper surface, yellowish or grayish-tomentose underneath; leaflets oblong to ovate, terminal one shallowly cordate and 5–8 cm. long and more than one-half as broad and usually pointed, margins unequally and coarsely sharply serrate; lateral leaflets hardly cordate, nearly or quite sessile; petiole 5–7 cm. long, not very stout, bearing a few more or less bent prickles: inflorescence open-paniculiform, terminal, leafy at base, the branches slender and aculeate and singly to several-flowered, aculeate, the axes hairy-tomentose; flowers medium in size, petals obovate, much longer than the pubescent calyx-lobes: fruit black, with many drupelets, short-oblong, about 2 cm. long.

Santo Domingo: Valley of Constanza, Provincia de La Vega, 1170 m., *Eggers 2281*. Near Constanza, in pine woods, altitude 1250 m., *H. von Türckheim 3140*; floricane leaves rusty-tomentose underneath; primocane leaves less tomentose and greener on under surface. Focke originally (1890) based this species on Eggers collection at Constanza, but in Species Ruborum (1914) the plant is assigned also to region near Port-au-Prince, 1200–1500 m., without citation of collector; his reference of this station to Santo Domingo means undoubtedly that he adopts that name for the island, which in this paper (following Britton and others) is called Hispaniola. I have not seen *R. domingensis* from Haiti.

I have not had access to Eggers 2281, on which *R. domingensis* is based; but attention to Focke's two descriptions and to his two pictures in Species Ruborum readily verifies the species as he intended it.

† 8. **Rubus stimuleus,** spec. nov. Fig. 178.

Validus, axes teretes, pubescenti-tomentosi saltem apice; aculei multi, recti, basi lata, 7–9 mm. longi: folia 3-foliolata, glabra supra, pubescenti-tomentosa infra, margines inæqualiter dentato-serrati; foliola ovata, angusta vel subtruncata basi, 5–6 cm. longa, 3–4 cm. lata, acuta; petiolus 1.5–3 cm. longus, uncinatus, pubescens: inflorescentia foliosa, paniculiformis, pæne vel admodum terminalis, axes pubescentes et aculeati; corolla 2.5 cm. lata, petala obovata, obtusa; lobi calycis pubescentes, lanceolato-ovati, breviores quam petala: fructus parvus, minor quam 1 cm. diam., drupeolæ paucæ.

Probably erect, glandless, height and habit not recorded; canes stout, terete, closely pubescent at least toward apex, bearing frequent strong straight broad-based prickles 7–9 mm. long: leaves 3-foliolate or those in the inflorescence simple and ovate with narrowing base; leaflets ovate, mostly narrowed toward base but sometimes subtruncate, 5–6 cm. long, 3–4 cm. broad, prominently pointed, glabrous and dull and somewhat rugose above, brownish soft-pubescent underneath, midrib bearing a few short hooked prickles, margins stoutly and unevenly dentate-serrate; petiole stout and short, 1.5–3 cm. long, well provided with hooks, brownish-pubescent: inflorescence terminal, paniculiform, leafy, and other short

178. Rubus stimuleus, very prickly new species from Provincia de La Vega, in Santo Domingo.

clusters in the upper axils, the axes closely pubescent and aculeate; flowers about 2.5 cm. across, petals obovate and very obtuse; calyx pubescent, lobes ovate to lance-ovate, acute, much shorter than the corolla: fruit small, less than 1 cm. across, drupelets very few.

Santo Domingo: Paso Bajito, fourteen kilometers from Jarabacoa on road to Constanza, Provincia de La Vega, 1250 m. altitude, *Jiménez*. Distinguished readily from *R. domingensis* by the longer not cordate leaflets that mostly taper to base, stouter more strongly armed petioles, different serration, more leafy inflorescence, prickles on peduncles uncinate, fruit much smaller and with fewer drupelets.

† 9. **Rubus haitiensis,** spec. nov. Fig. 179.

Magnus, varius, primocani erecti ad 2 m., rami et floricani arcuati vel procumbentes, fortasse horizontales, non radicantes apice; axis validus, teres, 10–12 mm. crassus, pubescens; aculei multi, validi, basi lata, recti vel curvi, 7–9 mm. longi: folia abundantia, nec pergamentacea nec lucida, supra pubescentia, fulvo-tomentosa et rugosa infra, fere 3-foliolata; foliola ovata, oblonga vel elliptica, 5–8 cm. longa, 3–4 cm. lata, fere acuta vel acuminata, interdum subcordata basi, margines valde serrati; petiolus validus, pubescens, aculeatus: inflorescentia racemiformis et cymiformis, terminalis et lateralis in axilis superioribus, raches pubescentes et aculeatæ; flores circa 3 cm. diam., petala lata obtusaque; lobi calycis lati, fere aculeati, breviores quam corolla: fructus brevi-oblongus, 1 cm. vel plus diam., drupeolæ magnæ.

Variable big bramble, primocanes erect to 2 m. but floricanes lopping or becoming more or less prostrate, or at least the branching diffuse, making a tangled arching mass of foliage and briars with canes 2–3 m. long, the horizontal parts not rooting at tip; primocane axis stout, terete, sometimes 10–12 mm. thick, thinly pubescent at least toward the tip, well beset with stout broad-based straight or hooked prickles that are frequently 7–9 mm. long: leaves not pergamentaceous or habitually persistent, dull and soft-pubescent on upper face, mostly 3-foliolate but sometimes 5-foliolate on strong primocanes and the leaflets then conspicuously narrow and acuminate, sometimes simple in the flower-cluster; leaflets ovate to oblong or elliptic, various in size and shape, 5–8 cm. long, 3–4 cm. broad, acute or acuminate and those on lateral branches perhaps nearly or quite obtuse, sometimes subcordate at base, closely and scantily pilose above, brown-tomentose and rugose underneath and midrib bearing small hooks, margins coarsely and unevenly serrate; petiole stout, pubescent, with prominent hooks: inflorescence diffuse, terminal and from the upper leaf-axils, either cyme-like or raceme-like in form, making altogether a striking display of bloom and fruit well above the abundant foliage, axes all brown- or gray-tomentose and carrying a few straight or curved prickles, bracts prominent, ultimate pedicels very short; flowers large, usually 3 cm. or more across, the petals broad and obtuse; calyx densely tomentose, lobes broad, usually apiculate and much shorter than the petals: fruit short-

179. RUBUS HAITIENSIS, frequent in the high mountains of Massif de la Selle, southern Haiti, now first recognized as a distinct species.

oblong, 1 cm. and more thick, drupelets large, calyx-lobes spreading or usually not completely reflexed.

Haiti: abundant on mountains, Ouest; Forets-de-Pins at high altitude in Massif de la Selle, *Bailey 187, 188, 189* (type), *190, 191, 196, 205*; above Fonds Verrettes, *Bailey 210, 211*. Ordinarily mistaken for *R. domingensis*.

A similar plant but probably distinct, primocanes only, comes from Las Guazumas, Provincia de Santiago, Santo Domingo, at 780 m. in pine forest.

180. Rubus panamanus, new species, from the Chiriqui region of Panama, to be distinguished from *R. coriifolius* of Mexico: note Fig. 181.

ARTICLE 10.
RUBI OF PANAMA.

Republic of Panama is practically an unknown territory in respect of Rubus. Hemsley in his Biologia Centrali-Americana, 1880, makes two extensions to Panama on the authority of Seemann, *Rubus floribundus* and *R. occidentalis*, neither one of which are we prepared to accept at the present day. Rydberg in North American Flora, 1913, assigns three species as ranging to Panama, only one of which can we now accept, and two others extending from Mexico to South America and therefore presumably in Panama, only one of which can we admit. Standley in his Flora of the Panama Canal Zone, 1928, knows none in his territory. The collections in Panama are very meager, and some of these few are unidentifiable. So far, we are able to make out five species.

I. *Blackberries.* Fruit (syncarp) composed of drupelets that adhere to receptacle and the aggregation falling as one body or "berry"; druplets rather large, mostly loosely aggregated: main stems commonly prickly, usually angled or furrowed, neither glossy or pruinose.

A. Axis of canes and inflorescence glabrous or tomentulose, not hairy or hispid or setose: fruits pendent ..... 1. *R. panamanus*

AA. Axis of canes and inflorescence prominently hairy or hispid or setose: fruits erect.

B. Canes beset with glandiferous hairs ..... 2. *R. præcipuus*

BB. Canes not glandiferous.

C. Leaflets gradually acuminate, pubescent only underneath: canes thickly shaggy with long fulvous hairs; prickles few on axis: clusters open ..... 3. *R. trichomallus*

CC. Leaflets abruptly contracted into a narrow almost caudate end: canes pubescent but not closely long-hairy; prickles many: clusters very dense ..... 4. *R. tantus*

II. *Raspberries.* Fruit a cup of drupelets separating from the receptacle (which remains on the plant); drupelets small, much compacted: main stems or axes usually evenly terete, polished and mostly pruinose ..... 5. *R. glaucus*

† 1. **Rubus panamanus,** spec. nov. Fig. 180.

Diffusus, ramosus, scandens; axes angulati, subalbo-pubescentes; aculei pauci, sparsi, 2–3 mm. longi: folia 3-foliolata (vel simplicia in inflorescentia), glabra supra, costis lateralibus subalbis conspicuisque; infra pallidiora et pubescentia, costa media aculeis uncinatis; foliola angusto-elliptica, 8–10 cm. longa, 4–5 cm. lata, abrupte acuminata, non cordata, minute et acute serrata; petiolus 6–8 cm. longus, gracilis, aculeatus: inflorescentia racemiformis, axillaris et terminalis, parva brevisque, pedicelli brevissimi, rachis pubescens; flores albi, 1 cm. vel minus diam., petala acuta: fructus oblongus, pendens, circa 1 cm. longus, drupeolæ multæ, lobi calycis reflexi.

Diffuse branching scandent shrub; canes angled, closely whitish-pubescent or tomentulose, bearing few scattered hooked prickles 2–3 mm. long; primocane unrecorded: floricane leaves 3-foliolate, or perhaps simple in the inflorescence, minutely pubescent on upper surface with whitish lateral ribs conspicuous, finely pubescent-tomentulose on veins underneath and lighter colored; leaflets narrow-elliptic, the terminal one 8–10 cm. long and about one-half as broad, narrowing or rounding to base and not cordate, rather abruptly narrowed into a long point, lateral leaflets of similar size but sometimes much smaller, midrib underneath bearing a few short hooks, margins very closely and finely and sharply serrate; petiole slender, 6–8 cm. long, pubescent, bearing hooked prickles, terminal petiolule long: flowers few to a dozen or so in axillary and a terminal racemiform open cluster, the axis or the pedicels tending to curve as the flowering progresses, the axillary clusters not exceeding the leaf and sometimes shorter than the petiole, rachis and peduncles pubescent, pedicels very short; corolla small, 1 cm. or less across, white, petals acute, gynœcium conspicuously dark colored: fruit pendent on curved pedicels, oblong, about 1 cm. long, drupelets many and closely packed, narrow calyx-lobes reflexed.

Panama: Chiriqui province at Bajo Chorro, Boquete District, 6000 feet altitude, as *R. alpinus, M. E. Davidson 72* (type Mo. Bot. Gard.).

This species has been mistaken for *R. coriifolius*, Liebm., of Mexico, but Fig. 181 shows at once the marked differences between the two in shape and margins of leaflets and in habit of inflorescence. Pubescence is also different. Fig. 181 is drawn from a Field Museum photograph of an authentic specimen in the Paris Herbarium.

† 2. **Rubus præcipuus,** spec. nov. Fig. 182.

Magnus, validus, cani interdum 5 m. longi; axes teretes, longis fulvisque pilis glandularibus, brevi pubescentia et remotis uncinatisque aculeis: folia floricani 3–5-foliolata, minute pilosa supra, hirsuto-pubescentia infra, costa media uncinata; foliola elliptica vel oblongo-acuminata, 8–11 cm. longa, 4–6 cm. lata, basis fere subtruncata vel subcordata, apex abrupte breviacuminatus, margines minute et acute serrati; petiolus validus, uncinatus: inflorescentia terminalis, paniculiformis, foliosa basi, 20–30 cm. longa, rachis continua, glandulari-pilosa; flores albi vel rosei, 2–2.5 cm. lati, petala obtusa; calyx tomentosus, interdum glandiferus, lobi multo breviores quam corolla: fructus oblongus, 2 cm. longus, drupeolæ multæ et sarcosæ.

Large shrub, canes sometimes to 5 m. long; axes terete, thickly covered with brownish glandular hairs and fine pubescence underneath, bearing few remote broad-based hooked prickles 2–3 mm. long; primocanes not recorded: leaves of floricanes large, 3–5-foliolate (sometimes 1 or 2 simple leaves in inflorescence), dull and minutely hairy on upper surface, softly hairy-pubescent on under surface and the midrib uncinate, margins with exceedingly numerous small narrow sharp serratures; leaflets oblong-acuminate or elliptic-acuminate, 8–11 cm. long, 4–6 cm. broad, base mostly subtruncate or subcordate, apex rather abruptly short-acuminate; petiole and terminal petiolule stout and long, glandular-hairy and with stout hook, more or less pubescent on the surface: inflorescence terminal, paniculiform,

181. RUBUS CORIIFOLIUS, Liebmann, of Mexico, to distinguish *R. panamanus* in Fig. 180. Drawn from a Liebmann specimen in Paris.

182. RUBUS PRÆCIPUUS, new species, from Provincia de Chiriqui, Panama. Note the big terminal inflorescence and the minutely serrated leaflets.

with a few stout floral branches in upper axils, 20–30 cm. long, the central rachis continuous to apex, branches, peduncles and pedicels strongly glandular-hairy; flowers white to pink on the same plant, 2–2.5 cm. across, petals usually broad and obtuse; calyx tomentose, usually bearing a few glandular hairs, lobes ovate-acute, much shorter than corolla: fruit oblong to thimble-shaped, very seedy, to 2 cm. long, the glabrous drupelets pulpy.

Panama, in Chiriqui: Quebrada Velo, 1800 m. altitude, *Woodson & Schery 275* (type); vicinity of Casita Alta, Volcán de Chiriqui, about 1500–2000 m. altitude, *Woodson, Allen, Seibert 801, 869*, called "Zarsamora."

This species is allied to *R. adenotrichos*, Schlecht. of Mexico, but that plant is more slender, bears smaller and typically narrower leaflets that are more gradually acuminate, much shorter and blunter serratures, more diffuse and slender inflorescence, probably much smaller fruits.

3. **Rubus trichomallus,** Schlecht. in Linnaea, xiii, 268 (1839). Fig. 183.

Vigorous big bramble 2 m. tall or long with very shaggy brown-hairy but not glandular angled or nearly terete canes that are closely pubescent on the surface and that bear remote hooked prickles: leaves large and numerous, 3–5-foliolate, puberulent or short-hairy and dull on upper surface, gray- or whitish-tomentose and conspicuously side-ribbed underneath, margins finely and unevenly acutely serrate; leaflets narrowly ovate-elliptic, acuminate, 8–10 cm. long, 3–5 cm. broad, terminal one and sometimes the laterals subcordate; petiole stout, hairy and pubescent, bearing strong hooks: inflorescence paniculiform in one terminal and a few upper axillary clusters that are borne on stout prominent brown-hairy and usually prickly peduncles, the pedicels few on each peduncle and commonly not more than 1 cm. long; flowers white, very small, about 1 cm. diam., petals narrow, obtuse; calyx small, tomentose, the narrow lobes not equalling the corolla: fruit small, reported as red, short-oblong, about 1 cm. long, seedy.

Panama: Cerro Vacā, eastern Chiriqui, in forest or in thickets, 900–1136 m. altitude, *Pittier 5721*; pastures around El Boquete, Chiriqui, 1000–1300 m., *Pittier 3139*; vicinity of El Boquete, *Maxon 4927*; vicinity of El Valle, Coclé, *Allen 1189, 1647, 1776*.

This species was described by Schlechtendahl from the state of Vera Cruz, Mexico, but we do not know the type material; Liebmann subsequently reported it from Oaxaca and also from Costa Rica. Some of the material referred to it from Costa Rica and Panama in later time has been erroneously determined; one of these collections from Panama is now separated as *R. tantus*. In fact, it is not yet clear whether true *R. trichomallus* occurs in Panama, so that the present assignment is tentative; Fig. 183 is drawn from Panama material, Allen 1647. The situation cannot be rectified until a wide range of Rubus in South America is given a critical overhauling.

The situation is complicated by Focke's opinion that *R. trichomallus* is referable to *R. urticæfolius*, Poir., and he allows this species wide range

183. Rubus trichomallus, Schlechtendal, or a plant passing as that Mexican species, known in Panama from Chiriqui and Provincia de Coclé; picture drawn from specimen from the latter province. There are no glandular hairs among the setæ.

in South America, as in Colombia, Venezuela, Brazil, Bolivia, Paraguay. I have collected the plant in Venezuela and Brazil. However, Poiret in 1804 described his plant, *R. urticæfolius*, from Peru; photograph of his specimen and material in my collection from Peru show a very different plant from those in Colombia, Venezuela and Brazil; what these other brambles are will require careful study to determine, with abundant material. Rydberg in North American Flora kept this other material in *R. trichomallus*, relegating Poiret's Peruvian *R. urticæfolius*; unfortunately, this disposition also fails to meet the present requirements.

† 4. **Rubus tantus,** spec. nov. Fig. 184.

Validus, rectus; cani teretes, valde pubescentes sed non pilosi; aculei multi, recurvi, acutissimi: folia 3–5-foliolata, pubescentia supra, griseo-tomentosa infra, margines minuto- acute serrati; foliola ovata vel ovato-elliptica, abrupte angustata ad brevem apicem vel caudum foliolum terminale plus vel minus subcordatum, 7–9 cm. longum, circa 4 cm. latum; petiolus 4–6 cm. longus, pubescens, aculei uncinati: inflorescentia terminalis et lateralis, in longis et pubescentibus pedunculis; flores parvi, rosei, crebrati, glomeruli paniculiformes; calyx tomentosus, lobi ovati vel apiculati: fructus parvus, drupeolæ paucæ.

Stout, upright, canes terete, pubescent or briefly soft-pubescent but not long-hairy or shaggy, prickles many and slenderly recurved: leaves 3–5-foliolate, somewhat pubescent on upper surface, gray-tomentose underneath, margins very closely and sharply serrate; leaflets ovate to ovate-elliptic, abruptly contracted at apex into a slender point or short cauda, terminal one more or less subcordate, 7–9 cm. long, about 4 cm. broad, laterals somewhat smaller; petiole 4–6 cm. long, prominently pubescent and bearing hooked prickles: inflorescence a terminal short close paniculiform cluster with lateral clusters in upper axils, peduncles strongly pubescent and bearing hooks; flowers many, crowded, pinkish-white, small; calyx tomentose, the lobes ovate and acute or apiculate: fruit small, with few drupelets.

Panama: vicinity of El Boquete, Chiriqui, 1000–1300 m. altitude, *Maxon 5107* (type U. S. Nat. Herb.); pastures around El Boquete, *Pittier 3127*.

Two species have been confused here, *R. costaricanus*, Liebm., of Mexico and the one now described as *R. tantus*. Figs. 184 and 185 show the contrasts in mode of flower-bearing, leaflet shape and serratures. Fig. 185 is drawn from a photograph of the Liebmann specimen of *R. costaricanus* in Copenhagen.

5. **Rubus glaucus,** Benth. in Plant. Hart. 173 (1839).

Erect or diffuse raspberry, 1–1.5 m. tall, rooting habit not disclosed; primocanes slender, terete, smooth, glaucous, branched; prickles scattered or remote, hooked, 2–3 mm. long: leaves 3-foliolate, dull green, glabrous on upper surface, gray- or white-tomentose underneath, margins minutely

184. Rubus tantus from Chiriqui in Panama, now described as a new species to distinguish it from *R. costaricanus*, Fig. 185.

185. RUBUS COSTARICANUS, Liebmann, to distinguish *R. tantus*, Fig. 184, which has been confused with it; drawn from a Liebmann specimen in Copenhagen.

unevenly serrate; leaflets elliptic-ovate to ovate-lanceolate, 6–10 cm. long, 4–5 cm. broad, long-acuminate, base narrow to somewhat rounded; petiole 5–7 cm. long, glabrous, bearing conspicuous long hooks: flowers mostly solitary, sometimes 2 or 3, on peduncles in upper axils shorter than leaves, making a broad loose few-flowered cluster on top of stem; corolla white, sometimes tinged green, about 1.5 cm. broad, petals narrow but obtuse; calyx tomentose, the ovate pointed lobes nearly as long as petals: fruit oblong or thimble-shaped, 1–5 cm. and more long, dark red becoming black, of good edible quality, calyx-lobes spreading, drupes pubescent.

Panama, in Chiriqui: Volcán de Chiriqui, Loma Larga to summit, 2500–3880 m. altitude, *Woodson, Allen, Seibert, 1081*; vicinity of C. Punta, 1500–2000 m., *Seibert 264*; llanos de volcán, about 1300 m., *Allen 1546*; El Boquete, 1000–3000 m., *Pittier 8135*.

Described originally from Mt. Pichincha, Ecuador, and known there as "Mora de Castillo"; Colombia, in wide range.